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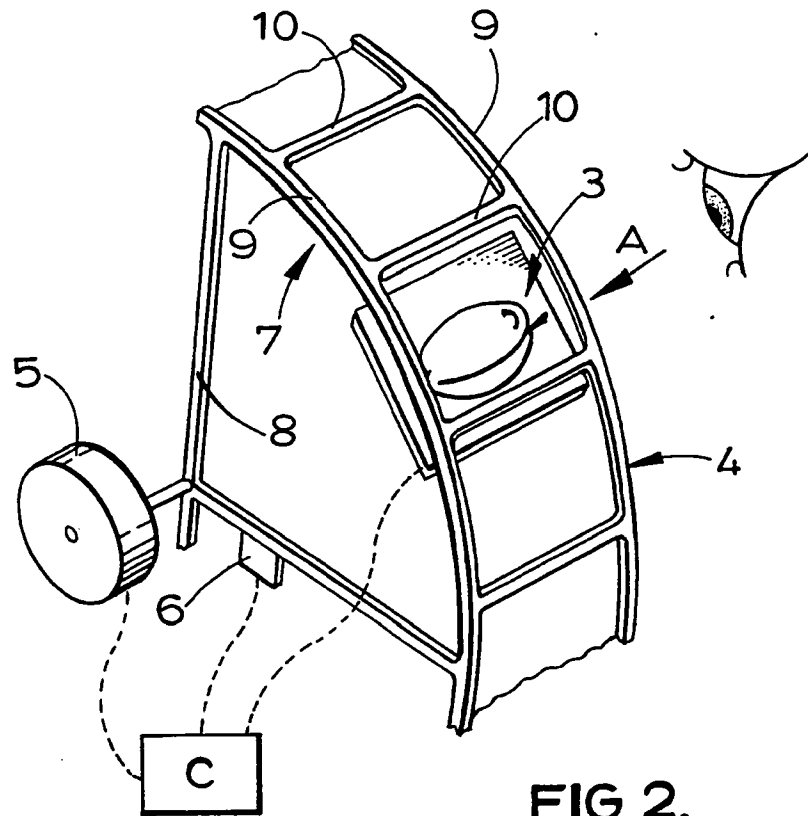


FIG. 2.

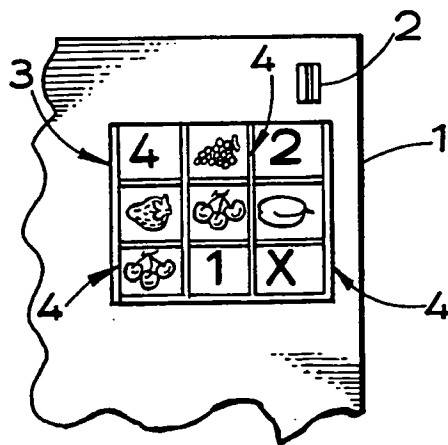


FIG. 1.

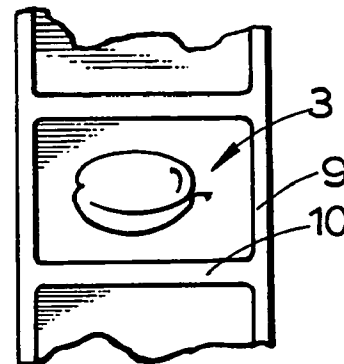


FIG. 3.

GAMING OR AMUSEMENT MACHINES

5 This invention relates to gaming or amusement machines of the kind which display a combination of symbols in response to a game being played on the machine.

10 It is common practice in the art of gaming or amusement machines (often called "fruit machines") to display symbols around the periphery of a rotating reel assembly and to place several of these reel assemblies side by side in order to build up a "win line" of combinations of fruit or other symbols. When a winning combination is achieved the machine usually pays out a prize.

20 It has been proposed to replace rotating reel assemblies with a cathode ray screen upon which images of reels are generated (see for example our British Patent No 1466765). However to a certain proportion of players of such machines this type of presentation does not have the same appeal as a physically rotating reel mechanism, no matter how realistically the symbols are portrayed. These machines are consequently not as popular as more traditional fruit machines with mechanical reels, and electronic screen fruit machines are considered to have limited chances of commercial success.

30 An aim of the invention is to improve the visual display of image - generated reels of gaming or amusement machines.

35 According to a first aspect the invention comprises a gaming or amusement machine comprising a display screen capable of showing images of symbols,

and a movable pseudo reel having mechanical frame means defining a series of windows which are registerable with the symbols displayed on the screen such that the images may be seen by the user as being framed by the frame means, at least when the screen displays a stationary image.

This improves the acceptability of a generated image fruit-machine, which allows us to overcome some disadvantages of mechanical reels. One problem associated with mechanical reels is that the size and number of the different symbols that can be displayed is restricted by the physical dimensions of the reel assembly. In order to display a larger number of symbols, as may be required by certain games, the individual symbols themselves would have to be small in size, and therefore less distinctive and less attractive to the player. In current mechanical reel machines, which in general are constrained to utilise very similar sizes of reel assembly, the maximum number of symbols situated around the periphery of the reel drum is of the order of 25.

A further advantage of the present invention is related to the fact that it is common practice during the life of a machine to change the game contained within its housing in order to maintain player interest, and this generally involves manually changing printed strips upon which the symbols are usually displayed as part of the reel mechanism. In conventional mechanical reel machines this entails ensuring that the new symbols contained on the printed strips are correctly lined up with the transparent viewing window of the machine. We can, in a preferred arrangement, simply change the microchip containing

the game programme, without having to alter the pseudo reels.

5        Preferably the frame means passes in front of the display screen.

10        The image on the screen is preferably arranged to move in synchronisation with the movement of the frame means so that any one symbol displayed on the screen appears to stay in its window as though it were mechanically fixed to the frame means, at least when the frame means is moving relatively slowly. Some game features, such as "skill-stop" may employ this scrolling of the symbols on the screen extensively.

15        The symbols produced by the screen may have greater resolution when the frame means is stationary, or moving relatively slowly, than when the frame means is moving relatively fast. A player is unlikely to be able to detect the reduction in resolution if the "reels" appear to be rotating quickly.

20        If the frame means is flexible it need not be cylindrical, so long as it appears to be part of a cylinder where it is superimposed with the display screen. Any closed loop frame means may be employed.

25        The frame means may comprise a strip or band having transparent window regions and opaque frame means. The strip or band may be flexible.

30        The frame means may itself carry one or more fixed symbols fixed relative to it. The image producing display screen may be obscured by the fixed symbols, or the screen may still be visible through it, the

fixed symbol being superimposed on the symbol of the display screen.

5 According to a second aspect of the invention we provide a pseudo reel for use in a machine in accordance with the first aspect of the invention.

10 According to a third aspect the invention comprises a method of improving the display of an image - producing display screen of a gaming or amusement machine comprising generating on a screen images of symbols moving past the screen, and moving a pseudo reel provided with a frame and windows past the screen synchronously with the images so that the images appear  
15 to be moving with the frame.

An embodiment of the invention will now be described by way of example only with reference to the accompanying drawings of which:-

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Figure 1 schematically shows the display screen of a fruit machine in accordance with the invention;

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Figure 2 schematically illustrates the principle of the invention; and

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Figure 3 shows the view seen by a player when he looks along the viewing arrow A indicated in Figure 2.

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The fruit machine of Figure 1 comprises a main body 1, a coin input slot 2, an electronic display screen 3, and three pseudo reels 4.

Figures 2 and 3 best illustrate the principle of the invention. The screen 3 and pseudo reels 4 are arranged to give the impression of being equivalent to three reels of a conventional mechanical display. The screen 3 is provided in a fixed position relative to the body 1, and the pseudo reels 4 extend in front of the screen 3 and are rotatable by a stepper motor 5. An electronic controller C controls the display on the screen 3 and the movement of the pseudo reels 4. A sensor 6 sends signals to the controller indicative of the position of the pseudo reels 4 relative to the screen 3.

The screen 3 is a pixel - addressable colour liquid crystal display screen and is controlled by the controller to show nine symbols in a 3 X 3 matrix. The screen 3 could of course comprise three separate strip-like screen elements each being divided into three symbol-presenting segments by the controller C, or nine separate screen elements, each large enough to accommodate one symbol. The controller C would of course control the images produced on all of the screen elements of the screen.

The pseudo reels 4 comprise a peripheral frame region 7 connected to a central hub driven by the stepper motor 5 by spokes 8. The frame region comprises two axially spaced rings 9 connected by axially extending dividing bars 10. Contrary to normal practice the pseudo reels 4 are skeleton frames only, and there is no strip of thin plastics material which in a conventional arrangement would normally carry printed symbols and would be attached to the periphery of the reel.

When the machine is first approached and viewed by a player through its viewing window (located over the screen 3) along arrow A of Figure 2, a respective pair of adjacent bars 10 and the respective portions of rings 9 between them frame each of the symbols displayed by the screen 3. The electronic display screen 3 can be viewed directly by the player and when the machine is not being played the screen 3 is arranged to show whatever symbols are required at that time (if any) and the appearance to the player will be that of symbols framed by the relevant elements of the pseudo reels 4, with the pseudo reels static in one of a number of index positions arranged such that at each of these positions the frame effect is symmetrically positioned with respect to the electronic display area as required in order to give the framed symbol effect.

Thus the appearance of the machine as far as the displayed fruit or other symbols is concerned will be very similar to that of a conventional machine.

Upon the commencement of a game, when it is required to change the fruit or other symbols displayed by the reel mechanism, the controller C will arrange for the pseudo reels to be rotated, and at the same time scroll the symbols, shown by the electronic display screen 3 in synchronisation with the pseudo reels so that it appears that the symbols displayed to the player are attached mechanically to the rotating pseudo reels. After the required period of rotation of the pseudo reels they will be brought to rest with the peripheral frame region 7 in one of its allowed index positions with respect to the screen 3. Whatever symbols are required are also displayed on the electronic display screen 3. Due to the mechanical



inertia of the rotating components the pseudo reels cannot be started or stopped instantaneously, and during acceleration and deceleration of the pseudo reels the controller C arranges that the symbols shown by the electronic display screen seen through the peripheral reel frame region are in rotational synchronism with the movement of the mechanical pseudo reels in order to maintain the effect that the symbols are part of the rotating mechanical pseudo reels when in fact they are being viewed through them and are part of a stationary device. Once the pseudo reels are rotating at high speed, should this be desired, the high degree of fidelity of reproduction of the symbols which is necessary when they are stationary may not be required. This enables us to use lower resolution representations of the symbols when the pseudo reels are rotating quickly. This firstly gives the impression of rotating at speed and secondly eases the burden on the controller of updating the symbols' positional information on the electronic display screen at a very high rate.

Of course, should it be necessary to give the appearance of a slowly-rotating reel mechanism this can be done by maintaining synchronism between moving symbols on the display screen and the mechanical pseudo reels at any desired speed of rotation.

Several variations are possible within the basic framework of the machine. For example, the pseudo reel drum assembly may not be constructed in a manner as described, but rather in the form of profiled sheet formings made out of thin plastics material such as may be found described in our patent application GB 8918448.5. The reel drum assembly may be of single-sided form as described in this

application, and the frame effect may be produced by forming the frame in relief on an attached peripheral plastic part as further described in this patent application or by printing the frame effect onto the surface of a peripherally-attached plastic strip. In addition, certain fixed symbols or indicia may be required to be printed onto or formed into such an attached peripheral strip, such that the electronic display screen located behind the strip may be either viewed through such symbols or indicia or in certain positions of the reel drum assembly may indeed be obscured by such permanent symbols. Details of the electronic display system could vary, for example, an electroluminescent or cathode-ray tube type, or any other appropriate means which would be capable of displaying the type of symbol images required, could be used.

The display area of the display screen may be smaller or greater than that shown in example. For example it may be commercially expedient to provide separate fruit-displaying screens for each fruit displaying location. The machine may only have one fruit-displaying location (in which case Figure 2 shows the entire display screen), or only three adjacent fruit displaying locations.

Thus we provide means of presenting symbols to the player in such a way that it is still apparent that the display means is basically mechanical, but which retains a high degree of flexibility in increasing the number of different symbols which can be displayed without compromising their size, and which also eliminates the need for individually printed strips on which the symbols are carried and which have to be installed and accurately set up and both on manufacture

of a fruit machine and upon subsequent conversion of the machine to play a new game.

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CLAIMS

1. A gaming or amusement machine comprising a display screen capable of showing images of symbols and a movable pseudo reel having mechanical frame means defining a series of windows which are registerable with the symbols displayed on the screen such that the images are seen by the user as being framed by the frame means, at least when the screen displays a stationary image.

2. A gaming or amusement machine according to claim 1 in which the game programme is changed by changing the microchip containing the game programme without having to alter the pseudo reels.

3. A gaming or amusement machine according to claim 1 or claim 2 in which the frame means passes in front of the display screen.

4. A gaming or amusement machine according to any preceding claim in which the image on the screen is arranged to move in synchronisation with the movement of the frame means, at least when the frame means is moving relatively slowly.

5. A gaming or amusement machine according to any preceding claim in which the symbols produced on the screen are of greater resolution when the frame means is stationary or moving very slowly than when the frame means is moving relatively fast.

6. A gaming or amusement machine according to any preceding claim in which the frame means is flexible.

7. A gaming or amusement machine according to claim 6 in which the frame means appears to be part of a cylinder where it is superimposed with the display screen.

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8. A gaming or amusement machine according to claim 6 or claim 7 in which the frame means comprises a closed loop.

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9. A gaming or amusement machine according to any preceding claim in which the frame means comprises a strip or band with transparent window regions and opaque frames.

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10. A gaming or amusement machine according to any preceding claim in which the frame means has one or more fixed symbols fixed relative to itself.

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11. A gaming or amusement machine according to claim 10 in which the image producing display screen is obscured when the fixed symbol registers with the image producing display screen.

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12. A gaming or amusement machine according to claim 10 in which the image producing display screen is still visible when the fixed symbol registers with the image producing display screen.

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13. A gaming or amusement machine substantially as herein described with reference to the accompanying drawings.

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14. A pseudo reel for use in a gaming or amusement machine of the kind which has a display screen capable of showing images, the pseudo reel comprising mechanical frame means defining a series of windows

which are registerable in use with images displayed on the screen such that the images are seen to be framed by the frame means at least when the screen displays a stationary image.

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15. A pseudo reel according to claim 14 in which the pseudo reel is flexible.

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16. A pseudo reel according to claim 14 or claim 15 in which the pseudo reel is a closed loop.

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17. A pseudo reel according to any of claim 14 to 16 in which the windows are defined by two axially spaced loops and a series of axially extending bars.

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18. A pseudo reel according to any of claims 14 to 17 in which the frame means is opaque.

19. A pseudo reel according to any of claims 14 to 18 in which the frame means consists of a strip or band.

20. A pseudo reel according to claim 19 in which the strip or band is flexible.

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21. A pseudo reel according to claim 19 or claim 20 in which the strip or band has windows made of a transparent material.

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22. A pseudo reel substantially as herein described with reference to the accompanying drawings.

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23. A method of displaying symbols on a gaming or amusement machine comprising generating images on a display screen, causing the images to move past the screen, and moving a pseudo reel pass the screen

synchronously with the images so that the images appear to be moving with the frame means.

5       24. A method of displaying symbols on a gaming or amusement machine according to claim 23 in which the pseudo reel is provided with a frame means and windows.

10       25. A method of displaying symbols on a gaming or amusement machine according to claim 23 or claim 24 in which the symbols displayed on the screen are of higher resolution when the frame means is moving relatively slowly or is stationary than when the frame means is moving relatively fast.

15       26. A method of displaying symbols on a gaming or amusement machine substantially as herein described with reference to the accompanying drawings.

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